Crestron Green Light™
DIN-HUB
DIN Rail Cresnet® Distribution Hub
Operations & Installation Guide

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This document was prepared and written by the Technical Documentation department at:

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Crestron Green Light™ DIN Rail Cresnet® Distribution Hub: DIN-HUB

Introduction

The DIN-HUB is a DIN rail-mounted Cresnet® hub designed to facilitate the configuration of large Cresnet networks. DIN rail mounting enables modular installation alongside Crestron® DIN Rail lighting and automation control modules and other third party DIN rail mountable devices.

Features and Functions

- Three-segment Cresnet hub
- Recommended for large Cresnet networks*
- Configurable power distribution
- No programming required
- 6M wide DIN rail mounting

* Use of a DIN-HUB is advised whenever the number of Cresnet devices on a network is greater than 20 or when the combined total length of Cresnet cable exceeds 914 meters (3000 feet).

Three-Segment Cresnet Hub

Cresnet is the communications backbone for Crestron lighting modules, wall box dimmers, shade controllers, thermostats, keypads, touchpanels, and many other devices. This flexible 4-wire bus normally supports approximately 20 Cresnet devices without requiring a hub. Larger systems are easily enabled by adding the DIN-HUB. The DIN-HUB features three isolated Cresnet segments, each supporting an additional 20 devices, allowing for systems of approximately 80 devices total (including the "host" segment). More hubs may be added to allow up to a maximum potential of 252 devices.*

*   The actual number of possible devices per segment and per network may vary depending upon the amount of data traffic, the length and geometry of network wiring, and the power requirements of every device. A general rule of thumb suggests approximately 20 devices, an aggregate of 914 meters (3000 feet) of cable, and up to a 75 Watt load per segment (wiring and devices permitting). In any case, 252 is the maximum number of possible devices on a complete Cresnet network. Contact Crestron True Blue Support (www.crestron.com/true_blue_support) for further design assistance.

Cresnet Power Distribution

In addition to data, Cresnet carries 24 Volts DC for powering the devices connected to it. The DIN-HUB provides an easy way to manage the distribution of power for a complete Cresnet network. Each segment can be configured to receive its power from the "host" power source or from another power supply. Separate power supplies may be dedicated to each segment, or a single supply can be shared amongst multiple segments as needed. Each segment supports up to 75 Watts.

DIN Rail Installation

The DIN-HUB is designed to snap onto a standard DIN rail for installation in a wall mount enclosure or mounted on a wall panel. Wiring connections are made using detachable screw terminals positioned along the top and bottom, clearly accessible from the front for easy installation and servicing. Diagnostic indicators are positioned on the center front panel. When installed in an enclosure utilizing 45 mm cutouts, the DIN-HUB's front panel stays visible while the connections are concealed.

Applications

The following diagram shows a DIN-HUB in a typical application.

DIN-HUB in a Typical Application
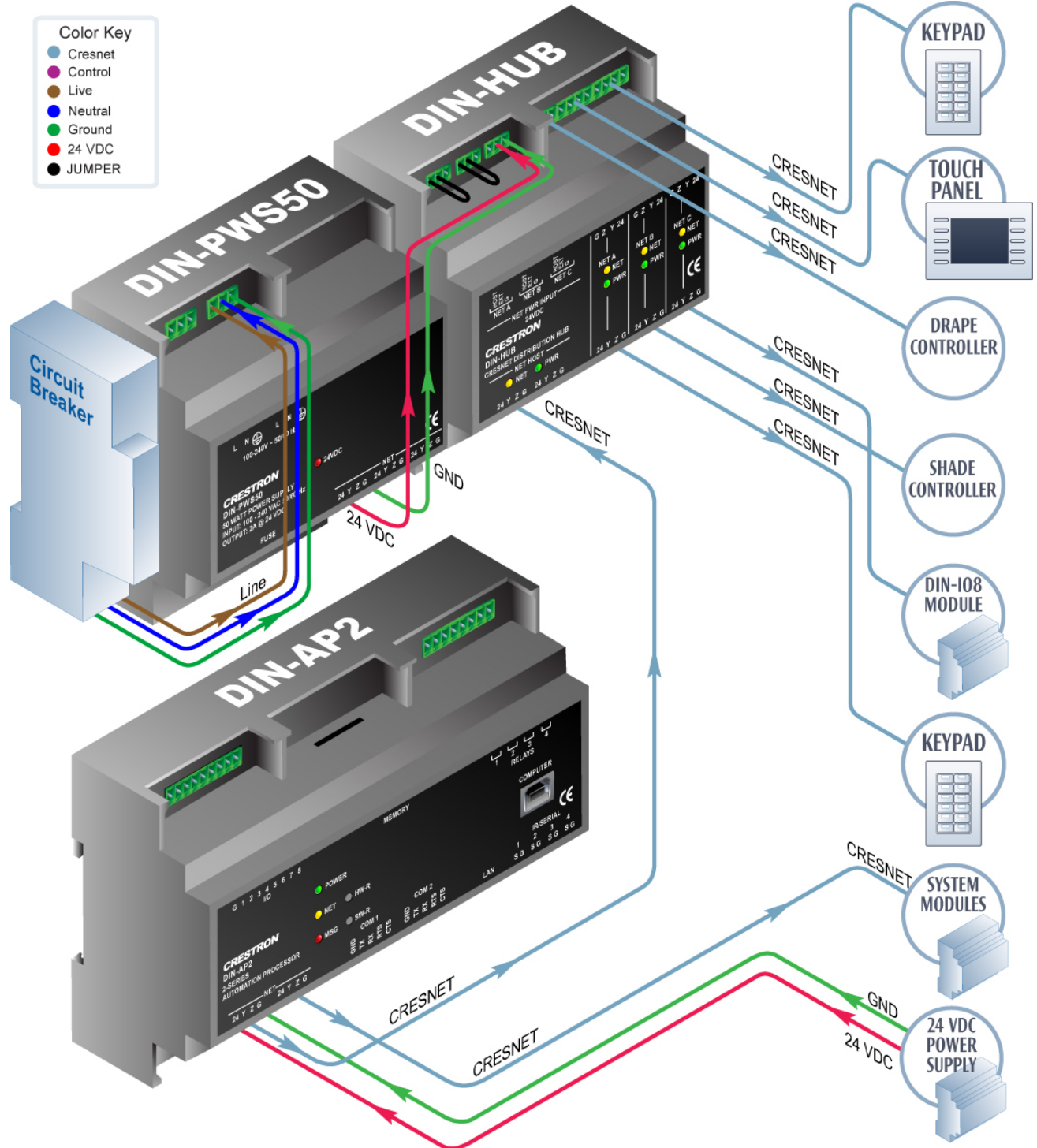
Specifications

Specifications for the DIN-HUB are listed in the following table.

DIN-HUB Specifications

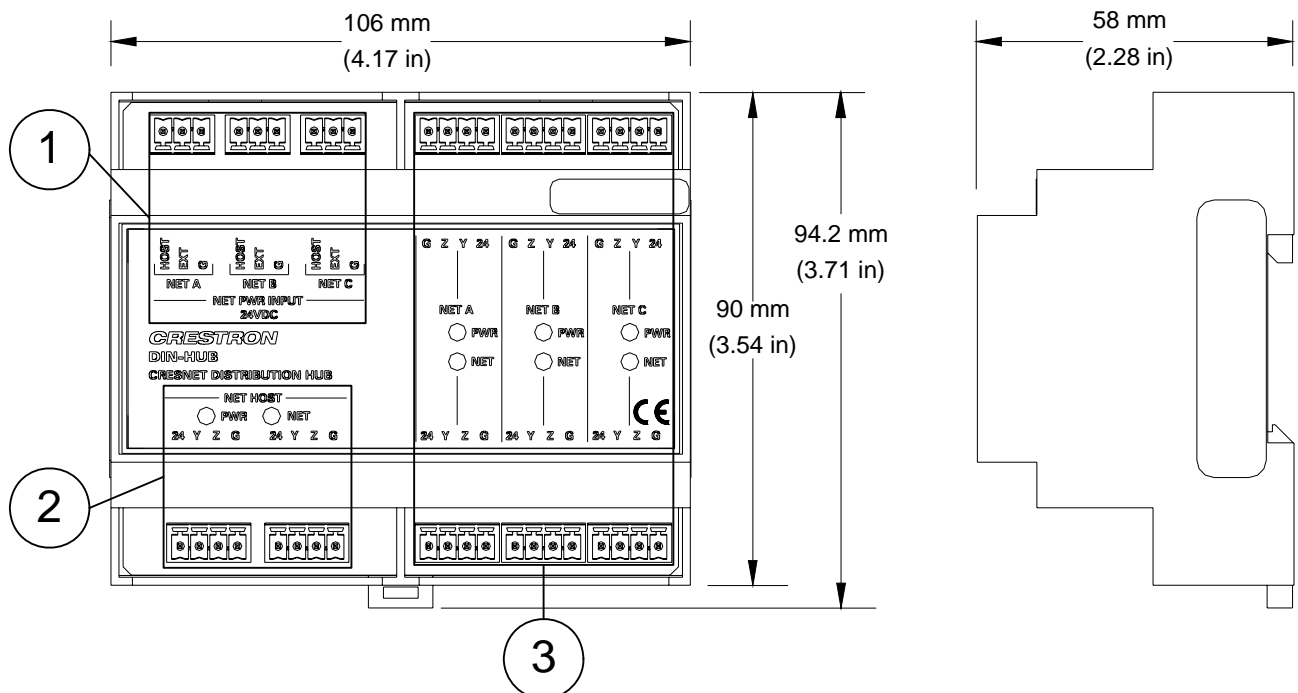| SPECIFICATION	DETAILS
Power Requirements	
Cresnet Power Usage	0.6 Watts (0.03 Amp @ 24 Volts DC)
Maximum Load per Segment	75 Watts (3.13 Amps @ 24 Volts DC)
Environmental	
Temperature	0° to 40°C (32° to 104°F)
Humidity	10% to 90% RH (non-condensing)
Heat Dissipation	2 BTU/Hr
Enclosure	Light gray polycarbonate housing with polycarbonate label overlay, UL94 V-0 rated, 35 mm DIN EN 60715 rail mount, DIN 43880 form factor for enclosures with 45 mm front panel cutout, occupies 6 DIN module spaces (108 mm)
Dimensions	
Height	94.2 mm (3.71 in)
Width	106 mm (4.17 in)
Depth	58.0 mm (2.28 in)
Weight	155 g (5 oz)
Available Accessories	
DIN-BLOCK	DIN Rail Cresnet Distribution Block
DIN-PWS50	DIN Rail 50 Watt Cresnet Power Supply

Physical Description

This section provides information on the connections, controls and indicators available on your DIN-HUB.
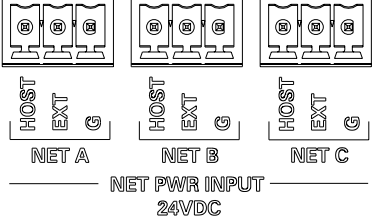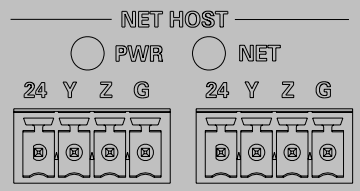
DIN-HUB Physical View
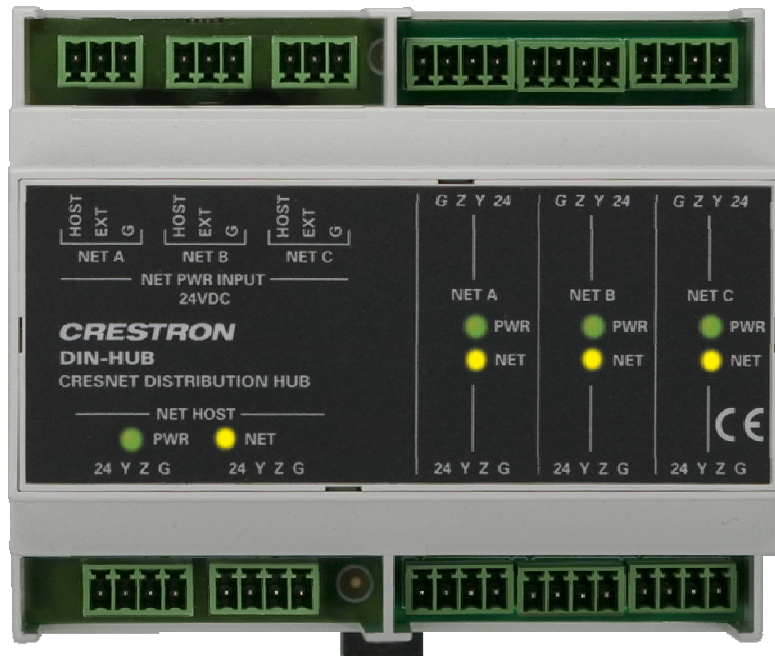
DIN-HUB Overall Dimensions

Connectors, Controls & Indicators

#	CONNECTORS[1], CONTROLS & INDICATORS	DESCRIPTION
1	NET PWR INPUT (A/B/C) HOST EXT G HOST EXT G HOST EXT G NET A NET B NET C NET PWR INPUT 24VDC	(3) 3-pin 3.5 mm detachable terminal blocks Cresnet power selection connectors for each segment Connect to external Cresnet power supplies, or to "host" power source via jumpers, to power devices connected to the **NET A/B/C** ports Max Wire Size: 1.5 mm^2 (16 AWG) Maximum Load per Segment: 75 Watts (3.13 Amps @ 24 Volts DC)

2	NET HOST and LEDs
	
	NET HOST
	◯ PWR ◯ NET
	24 Y Z G 24 Y Z G
		(2) 4-pin 3.5 mm detachable terminal blocks, paralleled
		
		Connects to Master **NET** port of DIN-AP2 or other control system, and loops through to additional DIN Rail Cresnet devices
		
		Max Wire Size: 1.5 mm^2 (16 AWG)
		    Pin 1 (24): Power (24 VDC)
		    Pin 2 (Y): Data
		    Pin 3 (Z): Data
		    Pin 4 (G): Ground
		
		(1) Green LED indicates Cresnet power is supplied to unit via either **NET HOST** port

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Connectors, Controls & Indicators (Continued)

#	CONNECTORS[1], CONTROLS & INDICATORS	DESCRIPTION
2	NET HOST and LEDs (Continued)	(1) Yellow LED indicates Cresnet bus activity at either **NET HOST** port
3	NET A/B/C and LEDs[2] G Z Y 24 G Z Y 24 G Z Y 24 NET A NET B NET C ○ PWR ○ PWR ○ PWR ○ NET ○ NET ○ NET 24 Y Z G 24 Y Z G 24 Y Z G	(6) 4-pin 3.5 mm detachable terminal blocks comprising (2) Cresnet ports (paralleled) per each of (3) segments Max Wire Size: 1.5 mm^2 (16 AWG) (3) Green LEDs indicate Cresnet power is available at **NET** ports of corresponding hub segment (3) Yellow LEDs indicate Cresnet bus activity at **NET** ports of corresponding hub segment

1. Interface connectors for **NET HOST**, **NET PWR INPUT**, and **NET** ports are provided with the unit.
2. **Y**, **Z**, and **G** terminals are paralleled within each segment.

Industry Compliance

This unit has been manufactured to comply with UL's Standards for Safety in Canada and the United States. Formal approval is pending.

As of the date of manufacture, the DIN-HUB has been tested and found to comply with specifications for CE marking and standards per EMC and Radiocommunications Compliance Labelling.

$$\mathsf{C}\,\mathsf{E} \quad \mathbf{C}$$

NOTE: This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

Setup

Network Wiring

When wiring the Cresnet® network, consider the following:

- Use Crestron Certified Wire.

  NOTE: Cresnet-HP wire cannot be used.

- Use Crestron power supplies for Crestron equipment.
- Provide sufficient power to the system.

  CAUTION: Insufficient power can lead to unpredictable results or damage to the equipment. Please use the Crestron Power Calculator to help calculate how much power is needed for the system (www.crestron.com/calculators).

For more details, refer to "Check Network Wiring" on page 14.

Installation

The DIN-HUB must be installed by a licensed electrician, in accordance with all national and local codes.

CAUTION: This equipment is for indoor use only. Mount in a well ventilated area. The ambient temperature must be 0º to 40º C (32º to 104º F). The relative humidity must be 10% – 90% (non-condensing).

The DIN-HUB is designed for installation on a DIN rail. Refer to the following diagram when installing.

Installing the DIN-HUB
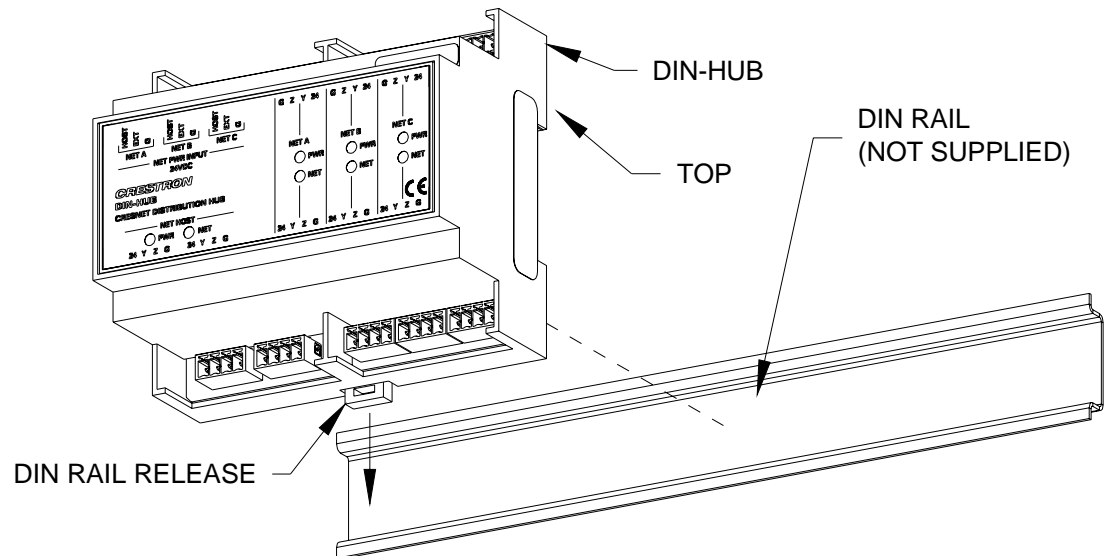
1. Place the top of the DIN-HUB's rail mount over the top of the DIN rail.

2. Tilt the bottom of the DIN-HUB toward the DIN rail until it snaps into place.

   NOTE: When mounting DIN rail products, it may be necessary to use a flat-head screw driver to pull the DIN rail release tab while snapping the device onto the DIN rail.

To remove the DIN-HUB from the DIN rail, use a small, flat object (i.e. a flat-head screwdriver) to pull the DIN rail release tab and tilt the bottom of the DIN-HUB away from the DIN rail.

NOTE: Certain third party DIN cabinets provide space for an informational label between each DIN rail row. Crestron's Engraver software (version 4.0 or later) can generate appropriate labels for all Crestron DIN rail products.

Hardware Hookup

Make the necessary connections as called out in the illustration that follows this paragraph. Refer to "Network Wiring" on page 9 before attaching the 4-position terminal block connector. Apply power after all connections have been made.

When making connections to the DIN-HUB, use a Crestron power supply.

*Hardware Connections for the DIN-HUB*
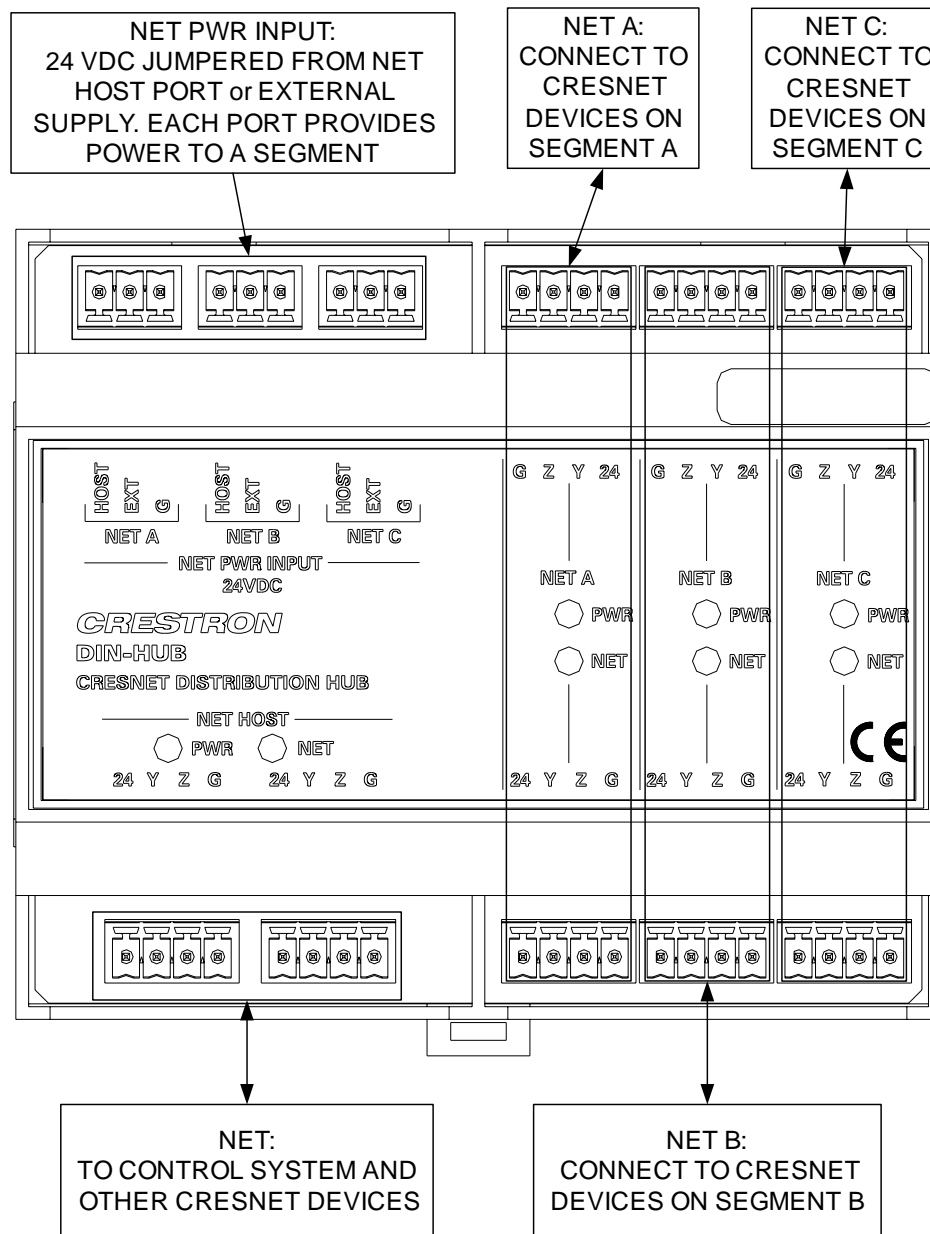
Power can be supplied from a DIN-PWS50 DIN Rail Power Supply or other Cresnet power supply connected to the **NET HOST** port. For more information, refer to the latest version of the DIN-PWS50 Operations & Installation Guide (Doc. 6667), which is available for download from the Crestron website (www.crestron.com/manuals).

NOTE: The DIN-HUB can only be powered by the **NET HOST** port. Power cannot be supplied from network devices that are connected to any of the segments.

Hub segments can be powered internally or from an external power supply like the DIN-PWS50.

To power a segment internally, install a jumper from the **HOST** pin to the **EXT** pin on the segment's **NET PWR INPUT** port as shown in the following diagram.

Powering a Hub Segment Internally (Segment A Shown)
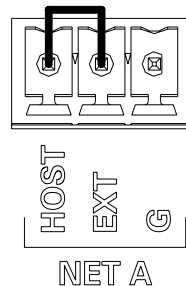
To power a segment externally, connect the external power supply to the **EXT** and **G** pins on the segment's **NET PWR INPUT** port as shown in the following diagram.

Powering a Hub Segment Externally (Segment A Shown)
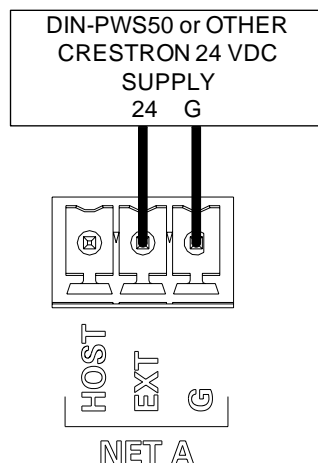
Problem Solving

Troubleshooting

The following table provides corrective action for possible trouble situations. If further assistance is required, please contact a Crestron customer service representative.

DIN-HUB Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
NET HOST PWR LED does not illuminate.	DIN-HUB is not receiving power.	Determine that the **NET HOST** port on the DIN-HUB is properly connected to a Cresnet power supply.
Segment's **NET** LED does not illuminate.	Segment is improperly wired.	Verify wiring connections: proper connector is used, cable in intact, and connections are secure.
	Device(s) attached to segment is not properly identified in SIMPL™ Windows®.	Use Crestron Toolbox to verify that the SIMPL Windows program recognizes all of the devices.
	Other segment is improperly wired.	Remove all segment connections except for segment attached to control system and segment for which the LED is not illuminating.

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DIN-HUB Troubleshooting (Continued)

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Segment's **PWR** LED does not illuminate.	Incorrect wiring at **NET PWR INPUT** port.	Verify that the **NET PWR INPUT** port is wired correctly for internal or external power.
	Insufficient power.	Verify that sufficient power is available. If necessary, connect the **NET PWR INPUT** port to an external power supply.
Network not working and only one LED is illuminated.	Wiring problem.	Disconnect segment that resulted in illuminated LED and correct wiring.

Check Network Wiring

Use the Right Wire

In order to ensure optimum performance over the full range of your installation topology, Crestron Certified Wire and only Crestron Certified Wire may be used. Failure to do so may incur additional charges if support is required to identify performance deficiencies because of using improper wire.

Calculate Power

CAUTION: Use only Crestron power supplies for Crestron equipment. Failure to do so could cause equipment damage or void the Crestron warranty.

CAUTION: Provide sufficient power to the system. Insufficient power can lead to unpredictable results or damage to the equipment. Please use the Crestron Power Calculator to help calculate how much power is needed for the system (www.crestron.com/calculators).

When calculating the length of wire for a particular Cresnet run, the wire gauge and the Cresnet power usage of each network unit to be connected must be taken into consideration. Use Crestron Certified Wire only. If

Cresnet units are to be daisy-chained on the run, the Cresnet power usage of each network unit to be daisy-chained must be added together to determine the Cresnet power usage of the entire chain. If the unit is home-run from a Crestron system power supply network port, the Cresnet power usage of that unit is the Cresnet power usage of the entire run. The wire gauge and the Cresnet power usage of the run should be used in the following equation to calculate the cable length value on the equation's left side.

Cable Length Equation

$$L < \frac{40,000}{R \times P}$$

Where:
L = Length of run   (or chain) in feet
R = 6 Ohms (Crestron Certified Wire : 0.75 MM^2 (18 AWG))
P = Cresnet power usage of entire run   (or chain)

Make sure the cable length value is less than the value calculated on the right side of the equation. For example, a Cresnet run using 0.75mm^2 (18 AWG) Crestron Certified Wire and drawing 20 watts should not have a length of run more than 101 meters (333 feet). Cresnet-HP cannot be used.

NOTE: All Crestron certified Cresnet wiring must consist of two twisted pairs. One twisted pair is the +24V conductor and the GND conductor and the other twisted pair is the Y conductor and the Z conductor.

Strip and Tin Wire

When daisy-chaining Cresnet units, strip the ends of the wires carefully to avoid nicking the conductors. Twist together the ends of the wires that share a pin on the network connector and tin the twisted connection. Apply solder only to the ends of the twisted wires. Avoid tinning too far up the wires or the end becomes brittle. Insert the tinned connection into the Cresnet connector and tighten the retaining screw. Repeat the procedure for the other three conductors.

Reference Documents

The latest version of all documents mentioned within the guide can be obtained from the Crestron website (www.crestron.com/manuals). This link will provide a list of product manuals arranged in alphabetical order by model number.

List of Related Reference Documents

DOCUMENT TITLE
DIN-PWS50 DIN Rail 50 Watt Cresnet Power Supply

Further Inquiries

If you cannot locate specific information or have questions after reviewing this guide, please take advantage of Crestron's award winning customer service team by calling Crestron at 1-888-CRESTRON [1-888-273-7876].

You can also log onto the online help section of the Crestron website (www.crestron.com/onlinehelp) to ask questions about Crestron products. First-time users will need to establish a user account to fully benefit from all available features.

Future Updates

As Crestron improves functions, adds new features and extends the capabilities of the DIN-HUB, additional information may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

Check the Crestron website periodically for manual update availability and its relevance. Updates are identified as an "Addendum" in the Download column.

Return and Warranty Policies

Merchandise Returns / Repair Service

1. No merchandise may be returned for credit, exchange or service without prior authorization from CRESTRON. To obtain warranty service for CRESTRON products, contact an authorized CRESTRON dealer. Only authorized CRESTRON dealers may contact the factory and request an RMA (Return Merchandise Authorization) number. Enclose a note specifying the nature of the problem, name and phone number of contact person, RMA number and return address.

2. Products may be returned for credit, exchange or service with a CRESTRON Return Merchandise Authorization (RMA) number. Authorized returns must be shipped freight prepaid to CRESTRON, 6 Volvo Drive, Rockleigh, N.J. or its authorized subsidiaries, with RMA number clearly marked on the outside of all cartons. Shipments arriving freight collect or without an RMA number shall be subject to refusal. CRESTRON reserves the right in its sole and absolute discretion to charge a 15% restocking fee plus shipping costs on any products returned with an RMA.

3. Return freight charges following repair of items under warranty shall be paid by CRESTRON, shipping by standard ground carrier. In the event repairs are found to be non-warranty, return freight costs shall be paid by the purchaser.

CRESTRON Limited Warranty

CRESTRON ELECTRONICS, Inc. warrants its products to be free from manufacturing defects in materials and workmanship under normal use for a period of three (3) years from the date of purchase from CRESTRON, with the following exceptions: disk drives and any other moving or rotating mechanical parts, pan/tilt heads and power supplies are covered for a period of one (1) year; touchscreen display and overlay components are covered for 90 days; batteries and incandescent lamps are not covered.

This warranty extends to products purchased directly from CRESTRON or an authorized CRESTRON dealer. Purchasers should inquire of the dealer regarding the nature and extent of the dealer's warranty, if any.

CRESTRON shall not be liable to honor the terms of this warranty if the product has been used in any application other than that for which it was intended or if it has been subjected to misuse, accidental damage, modification or improper installation procedures. Furthermore, this warranty does not cover any product that has had the serial number altered, defaced or removed.

This warranty shall be the sole and exclusive remedy to the original purchaser. In no event shall CRESTRON be liable for incidental or consequential damages of any kind (property or economic damages inclusive) arising from the sale or use of this equipment. CRESTRON is not liable for any claim made by a third party or made by the purchaser for a third party.

CRESTRON shall, at its option, repair or replace any product found defective, without charge for parts or labor. Repaired or replaced equipment and parts supplied under this warranty shall be covered only by the unexpired portion of the warranty.

Except as expressly set forth in this warranty, CRESTRON makes no other warranties, expressed or implied, nor authorizes any other party to offer any warranty, including any implied warranties of merchantability or fitness for a particular purpose. Any implied warranties that may be imposed by law are limited to the terms of this limited warranty. This warranty statement supersedes all previous warranties.

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